Claims 1-12 and 14-24 have been finally rejected under 35 U.S.C. 103(a) based on Yamashita in view of Peeters, further in view of Oyama et al. Claim 13 has been finally rejected under 35 U.S.C. 103(a) based on the same combination of references yet further in view of Heller et al.

These rejections are traversed for the following reasons, which lead to the conclusion that considering Yamashita in combination with Peeters and Oyama et al. or further in combination with Heller et al., the presently claimed affinity sensor for detecting specific binding events in response to a sample medium would not have been obvious to one of ordinary skill in the art.

Yamashita discloses a single electron transistor having two conductors mounted on a protein molecule with a quantum dot means positioned therebetween which permits tunneling when the quantum dot means is raised to a required potential.

The Examiner has rejected applicants' prior arguments as "attaching the references individually" and contends that the Oyama reference provides an incentive to combine the three references to arrive at the claimed invention. Applicants respectfully disagree with the Examiner's position.

Again the Examiner mischaracterizes the Yamashita reference as teaching an affinity sensor when it in fact teaches a transistor incorporating protein having a Flavin molecule therein which is switched by raising a potential on a gate

structure. Nothing in this reference suggests that the gate structure and protein with Flavin group can be replaced with the claimed binding pair to produce a tunneling effect.

Reiterating, Yamashita discloses a single electron transistor. A transistor is a controlled turn-on and turn-off switch (as, for instance, illustrated in the Standard Handbook for Electrical Engineers, 11th Edition, 1978, Figure 13-1, copy attached). The transistor disclosed by Yamashita is composed of two electrodes and a means acting as the controlled turn-on and turn-off switch. That transistor is not capable of detecting a binding event in response to a sample medium. Therefore, the transistor disclosed by Yamashita is not a sensor, let alone an affinity sensor for detecting specific binding events in response to a sample medium.

Even if Peeters discloses a microchip having a surface that is formed by a silicon wafer or by a glass target, and detection of other specific binding partners, this, too, does not rectify the fact that Yamashita has no relevance to the present invention.

As seen in the Response to Arguments section of the Office Action, the Examiner relies heavily upon the Oyama et al. teaching to claim there is motivation to combine the references. Even if Oyama et al. discloses a comb electrode structure, this does not rectify the fact that Yamashita has no relevance to the

present invention. Oyama discloses a DNA sensor wherein DNA binding with a target molecule disposed on a resonating device, reduces the mass of the target molecule and thereby alters a resonating frequency. This has absolutely nothing to do with binding pairs enabling electron tunneling. Yamashita only effects tunneling when a gate voltage is applied. Nothing suggests that the combining of a binding pair would provide for tunneling. Also, nothing in the references would provide one with a reasonable expectation of success in building a sensor as claimed wherein the combination of the binding pair effects tunneling.

Likewise, Heller cannot rectify that Yamashita has no relevance to the present invention.

Applicant respectfully requests a three month extension of time for responding to the Office Action. Please charge the fee of $465.00 for the extension of time to Deposit Account No. 10-1250. A Notice of Appeal accompanies this response.

Respectfully submitted,

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APPENDIX I

AMENDED CLAIMS WITH AMENDMENTS INDICATED THEREIN

BY BRACKETS AND UNDERLINING

1. (Thrice Amended) Affinity sensor for detecting specific binding events in response to a sample medium, comprising a carrier substrate provided with at least two electrodes and having a predetermined area, said electrodes being equidistantly spaced apart from each other and engagingly bordering said area on opposing sides, at least said area being adapted for receiving immobilized specific binding partners for coupling complementarily associated binding partners directly or via further specific binding molecules, said area being accessible <u>to</u> said complementarily associated binding partners provided in a sample medium and having a minimum width adapted for capture of at least one of said complementarily associated binding partners provided with one electrically conductive particle within said area in such a way as to allow for formation of a respective tunnel contact junction between the particle and the electrodes.

American Institute of Physics • American Institute of Physics Handbook
Baumeister • Mark's Standard Handbook for Mechanical Engineers
Beeman • Industrial Power Systems Handbook
Brady and Clauser • Materials Handbook
Burington • Handbook of Mathematical Tables and Formulas
Burington and May • Handbook of Probability and Statistics with Tables
Condon and Odishaw • Handbook of Physics
Considine • Energy Technology Handbook
Coombs • Basic Electronic Instrument Handbook
Coombs • Printed Circuits Handbook
Croft, Carr, and Watt • American Electricians' Handbook
Diebold Group, Inc., The • Automatic Data Processing Handbook
Fink • Electronics Engineers' Handbook
Giacoletto • Electronics Designer's Handbook
Gieck • Engineering Formulas
Gruenberg • Handbook of Telemetry and Remote Control
Hamsher • Communication System Engineering Handbook
Harper • Handbook of Components for Electronics
Harper • Handbook of Electronic Packaging
Harper • Handbook of Materials and Processes for Electronics
Harper • Handbook of Thick Film Hybrid Microelectronics
Harper • Handbook of Wiring, Cabling, and Interconnecting for Electronics
Henney • Radio Engineering Handbook
Hicks • Standard Handbook of Engineering Calculations
Hunter • Handbook of Semiconductor Electronics
Ireson • Reliability Handbook
Jasik • Antenna Engineering Handbook
Juran • Quality Control Handbook
Kaufman and Seidman • Handbook for Electronics Engineering Technicians
Korn and Korn • Mathematical Handbook for Scientists and Engineers
Kurtz • The Lineman's and Cableman's Handbook
Machol • System Engineering Handbook
Maissel and Glang • Handbook of Thin Film Technology
Markus • Electronics Dictionary
Markus • Handbook of Electronic Control Circuits
Markus and Zeluff • Handbook of Industrial and Electronic Circuits
McPartland • Handbook of the National Electrical Code
Perry • Engineering Manual
Skolnik • Radar Handbook
Smeaton • Motor Application and Maintenance Handbook
Smeaton • Switchgear and Control Handbook
Stout and Kaufman • Handbook of Operational Amplifier Circuit Design
Truxal • Control Engineers' Handbook
Tuma • Engineering Mathematics Handbook
Tuma • Handbook of Physical Calculations
Tuma • Technology Mathematics Handbook

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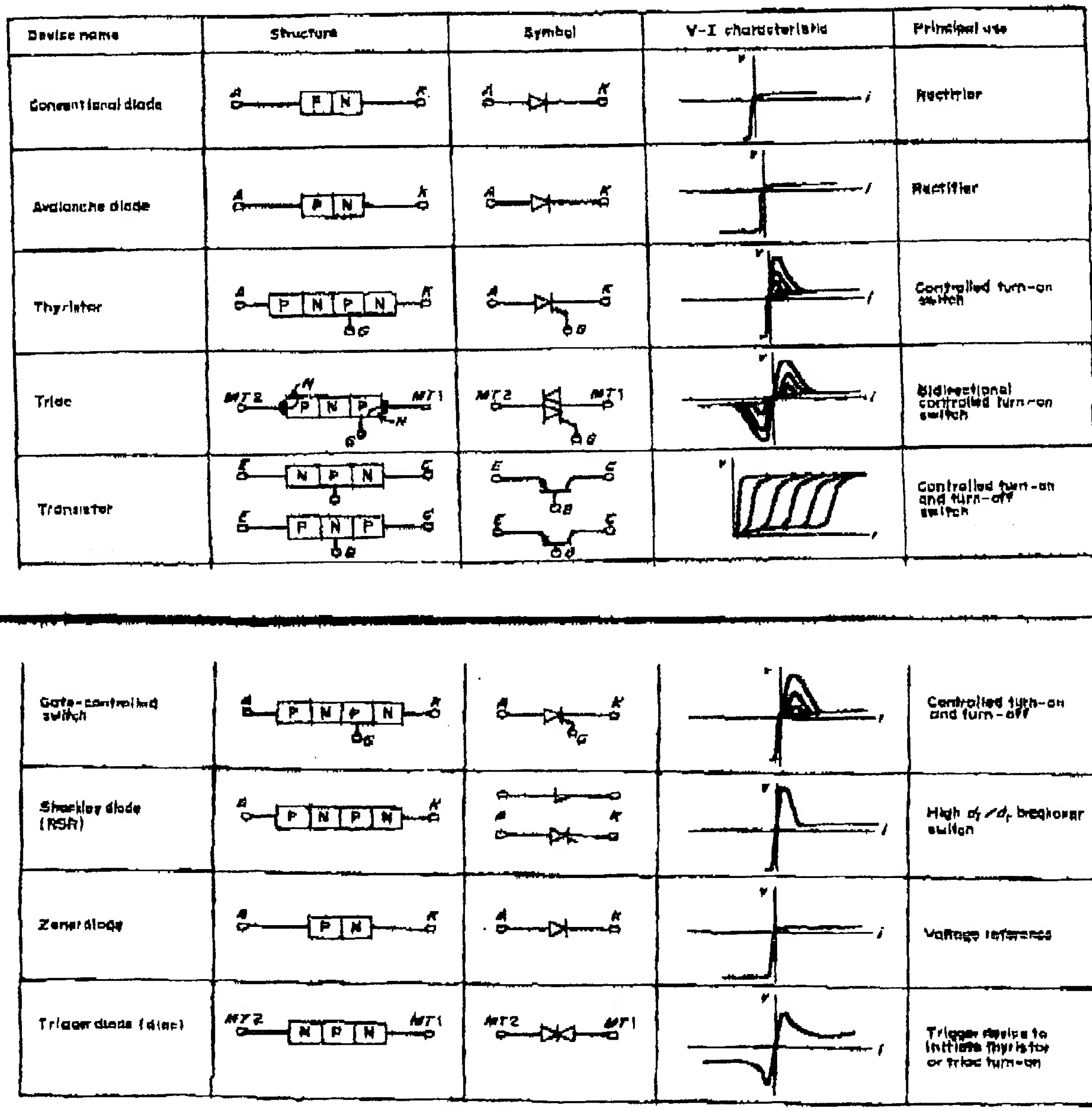

Fig. 10-1. Devices commonly used in power circuits.